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The
ANCIENT INHABITANTS
of the **SAN JUAN VALLEY**

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THE ANCIENT INHABITANTS

OF THE

SAN JUAN VALLEY.

As man becomes more intimately acquainted with the formation of the earth's crust, he realizes more forcibly how many, many ages have elapsed since the world emerged from apparent chaos on its march toward the goal of its present condition as a field for the development of the human race. Slowly and surely the wise Organizer has worked out his great plan, ever giving time for changed conditions to become adjusted and harmonized and adapted to the maintenance of the higher forms of life that were continuously appearing. Every line in the book of nature points to the gradual development of the earth's form and the life it maintains. So the more thoroughly we study the human race and attempt to trace its origin, the more forcibly are we convinced that its complete history starts with primitive life far back in the dim beginnings of things vital and that the creation of man, as we know him, is only the last great movement in this progress. So also has the development of man from the time when he first appeared "in the image of the Gods" been a gradual one, an evolution. As he gained courage to raise himself to an erect position, look upon the sun and the moon as his benefactors, and the forces about him as capable of becoming his servants, he began an advance that has continued to the present time. Where conditions have been exceedingly favorable and forces at work that seemed to challenge the best thought and effort of men, the progress has been marvelous, almost miraculous, when looked at from this great distance. So we gaze in amazement upon the massive structures of the ancient Egyptians and Assyrians, peruse with ever increasing admiration the record of the great wisdom and moral worth of the ancient Hebrews and the Hindus and are charmed by the artistic instinct and the grace of the ancient Greeks—all manifestations of the wonderful progress of the human race under most favorable circumstances and impulses. But where there were no rich valleys of the Nile, the Euphrates and the Ganges, and no

sunny slopes and fertile picturesque plains such as border the eastern Mediterranean, the advancement was far slower; and were it not for the influences that have continually reached out from these more favored centers to awaken the frontiers to greater efforts, many more parts of the Old and the New World would be today in an exceedingly primitive state of civilization.

But the favored spots of Europe, Asia and Africa were evidently not the only places in which man stopped long enough to sit down and think a little, study his surroundings, and utilize them in improving his conditions until he left a lasting impression upon the region of his habitation. Parts of America also were favorable for this work, and have left their record of a man's awakening to a larger life. In Mexico and Central America a civilization has been uncovered that extends far back into the beginning of the development of the human race. Here were peoples whose architectural and sculptural skill compare very favorably with that of ancient Egypt and Mesopotamia; who possessed a calendar and a written language, and who had established a system of theology. Their position had left them almost entirely uninfluenced by the greater civilizations of the eastern hemisphere, so that we find there the results attained by another branch of the human race evolving on another part of the habitation that the ages had been preparing for them. The facts so far brought to light show that groups of the human race in the primitive stages of their culture, when communication was almost impossible, have developed very slowly and along practically parallel lines. This is manifest in the similar religious conceptions, in the adaptation of materials to serve their needs, and in similar forms of pottery and style of decoration employed. The American cultures as well as those of the eastern hemisphere bear ample evidence of this truth; and furnish excellent material for the study of the intellectual, the artistic and the moral growth of mankind.

The inhabitants of Central America seem to have gained the highest round in the ladder of Western Hemisphere culture, while in Old Mexico the people followed a close second. There are found mighty temples and tombs decorated with massive

carvings in stone and elaborate designs in color, there are huge representations of their gods—primitive interpretations of the mighty forces they found about them—and there are the records of their heroes and leaders and the evidences of their social development during many, many generations. Stretching to the north of these centers are regions which were inhabited by peoples of varying degrees of lesser skill and culture.

In the southwestern part of the United States are the remains of groups commonly known as "Pueblos" and "Cliff Dwellers." They seem to have been the northern frontiersmen among the builders of permanent habitations and the ruins of their homes cover large sections of Arizona, New Mexico, southwestern Colorado, southern Utah, and extend into Nevada and California. In the summer of 1906, the writer made an examination of the ruins in Nine Mile canyon along the northern border of Carbon county, in the eastern part of Utah, and obtained no trace of ruins farther north in that region except one small house on the Green river about four miles north of where Nine Mile (Minnie Maud) creek joins the Green river. Mr. George Bishop of Smithville, in the western part of the state near the Nevada border, writes that there is a group of ruins a few miles from his place that seems to be a well defined pueblo; and Mr. Don McGuire of Ogden has obtained good specimens of pottery from a ruin near Brigham City. The Smithville ruins are on nearly the same parallel as those of Carbon county; but Brigham City lies far to the north. The writer has not yet had an opportunity to visit either of these sections. Both are interesting fields from the standpoint of the area covered by the ancient pueblo culture, and he hopes to extend his investigations to these places.

Southward from these stretch the ruins of the scattered homes and cemeteries of an ancient population. From the skeletons and mummified remains found in caverns and caves of the cliffs, it is evident that these people belonged to the great Indian family. They formed one of the groups of the original nations of this hemisphere. The handicrafts, the social organizations and the religious ideas of the modern pueblo tribes, especially the Hopi, seem to link themselves quite closely

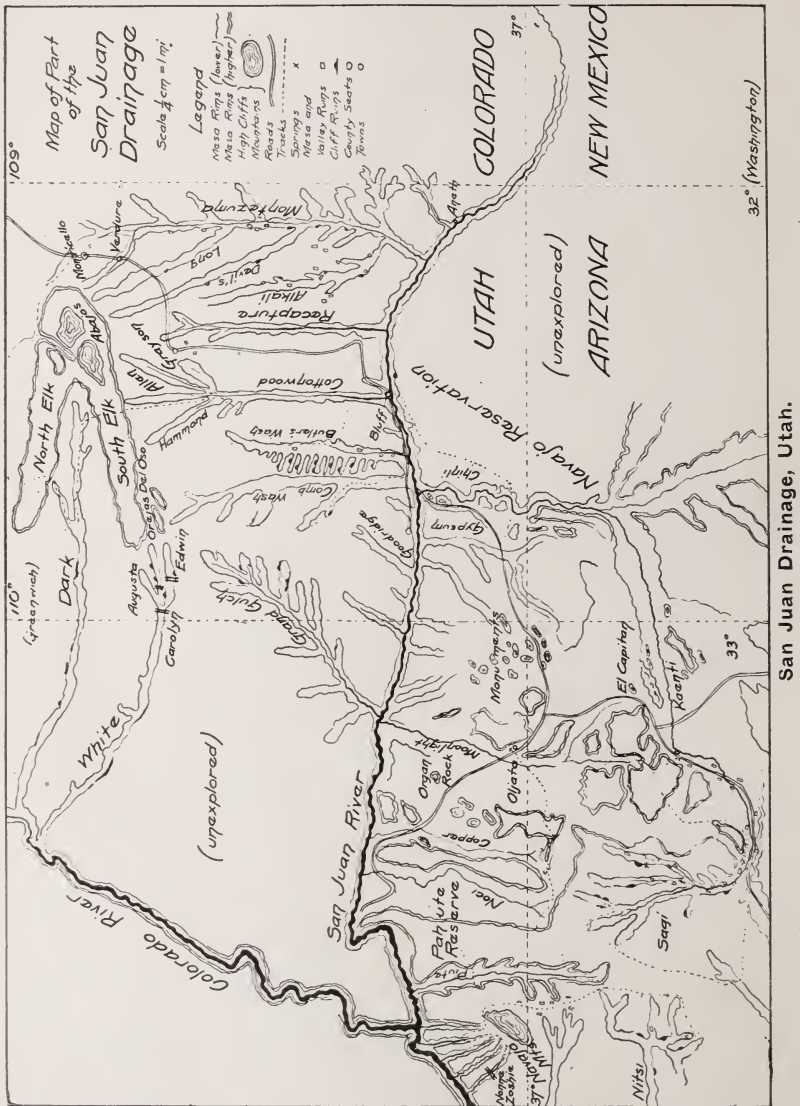
The complete history of Utah, then, does not comprise merely the record of the past seventy-five years, but covers with these ancient folk. Probably not only the pueblo tribes, but also the more nomadic Navajos and the Pahutes have descended in part from this early population. The traditions of all declare that they have sprung from the earth, the mother of all life, and point to a very long residence in that region. The Pahutes say, for instance, that it is right that Washington gave them that strip of land in southern Utah which was recently set aside as a Pahute reservation, because their fathers occupied that section long ages ago, lived in the caves before the men came that built the stone houses there, and also that they wore baskets on their heads that looked like horns. Pictures of basket-wearing men were found painted above the ruins of very primitive habitations in the backs of caves in Sagi ot Sosi Canyon in 1909. A very unusual specimen of basket, belonging probably to this early period, was presented to the University Museum in June, 1909. Old Hoskininni, a much revered chief of the Navajos, who died in November of that year, gave this basket to Mrs. John Wetherill, and told her where he had found it twenty-five years before. From his directions and descriptions of the location, the cave where the basket had been stored away in a pot hole was identified in one of the side gulches of Sagi ot Sosi. Hoskininni said he had accidentally dug it up when making a cache for some of his property; but being afraid of it, had left it in the cave. About a year ago, knowing Mrs. Wetherill's deep interest in Indian traditions and ceremonies, he brought it as a special gift of respect to Mrs. Wetherill, who later very generously turned it over to the State Museum. Hoskininni said it was very old and must have been a medicine basket. It is a well woven splint basket of peculiar shape, as seen from the illustration (page 34). It originally was decorated with a design in black, but this has almost disappeared. It probably was a mask worn as a hat by a medicine man in some religious ceremony. These may be the horned basket—hats referred to in the Pahute tradition. A similar basket was found in August, 1909, by Mr. Douglass' surveying party in a cave in Sagi canyon, about twenty-five miles from Sagi ot Sosi.

a long period of the earlier progress of men toward greater light and larger activity. These were her first citizens; and Utah is, perhaps, as old as the Rockies that form her spinal column.

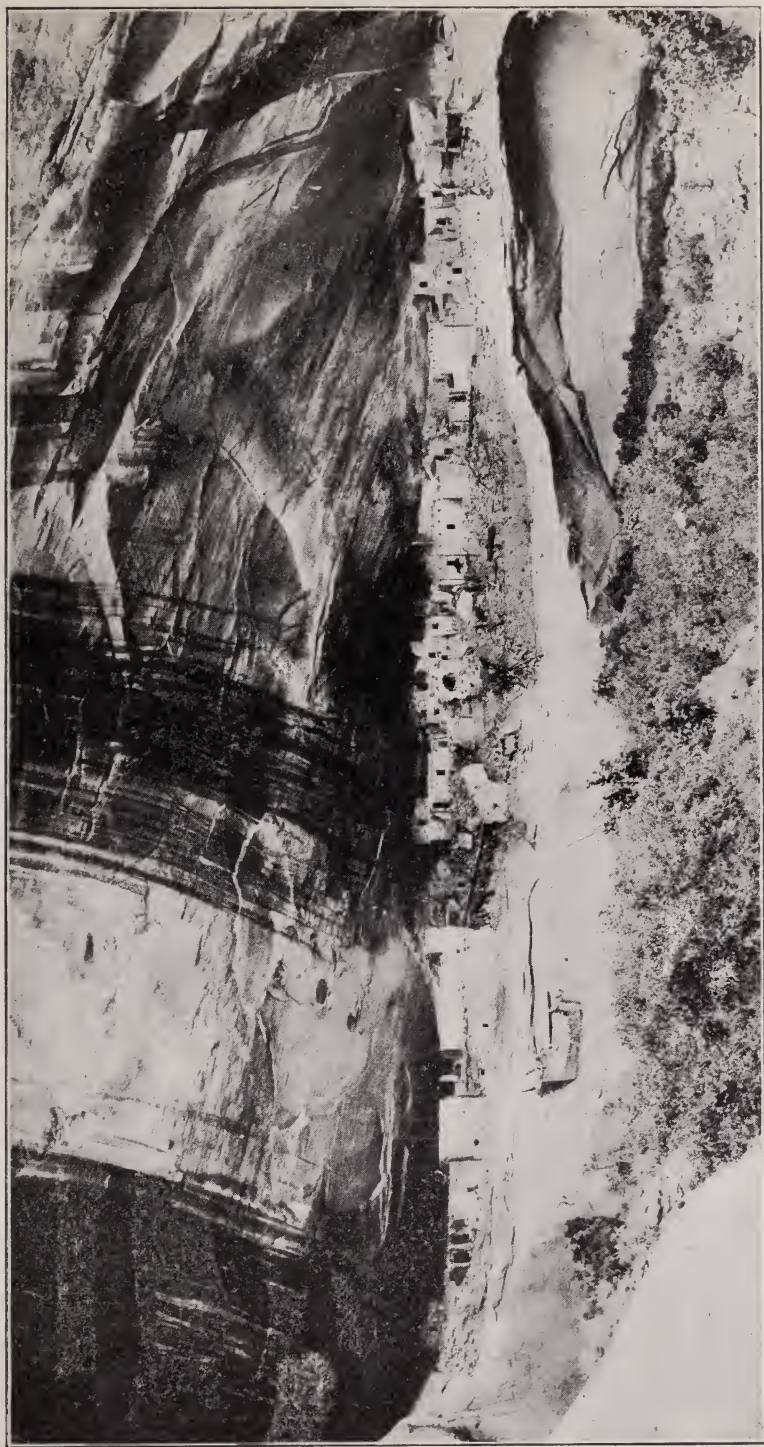
Water, food and firewood are the first essentials of a primitive people. The inhabitants of the wooded hills and mountains and wide stretching prairies of the greater part of North America found these in abundance, and needed only to roam where fancy guided and their prowess opened the way. Permanent and enduring homes were not necessary or desirable. They were knights of the free lance, ever seeking new adventures. But in the southwestern parts of the United States the barren spurs and ridges of the Rockies rest on lofty table lands through which run deep box canyons and sandy arroyos. Here nature never provided quite so bountifully for animal life and men found it necessary to depend largely upon plant life for sustenance. In order to secure a sufficient supply, those plants best adapted to man's needs had to be cultivated and their products stored, and more permanent habitations maintained. A vegetable diet necessitated more elaborate equipment for cooking and eating; the scarcity of skins, the preparation of other materials for clothing. The result was a greater development of the potter's art and greater skill in spinning and weaving. Man loves to create, to produce from the materials at hand something in which he feels an ownership. A permanent residence fosters this feeling and encourages the desire to accumulate personal property. With this accumulation of wealth and mastery of materials comes the necessity for greater security from enemies, and still more substantial and permanent homes are constructed. This development is plainly traceable in the ruins scattered over the southeastern part of Utah, where the densest portion of its ancient population seemed to have lived. Some idea of its extent may be gained from the accompanying map.

These ruins, found in the natural caves and beneath the projecting rim-rock of the cliffs that form the edges of the mesas and the sides of the deep box canyons, lie along the canyon beds and are scattered over the mesas. Those in the caves and beneath the sheltering rim-rock are commonly called

"cliff dwellings," while the groups in the valleys and on the mesas are spoken of as "pueblos"; but the term "pueblo"



houses in the cliffs as to those on the mesas and in the valleys, means a village, and can be applied as well to the groups of for the people were largely "pueblo" dwellers.



Kitsil (Broken Pottery House). A Large Cave Ruin in Sagi Canyon Containing 148 Rooms.

Ledges of stratified sandstone and beds of good clay are found throughout the region, and formed the principal building materials. Where workable stones were not close at hand the walls were laid with a greater proportion of clay, and in some instances entirely of clay adobe. Logs of wood also are found laid into the walls in a few cases, but, in the main, roughly squared sandstone laid in clay mortar formed the walls of the buildings.



Section of a Cave Pueblo Showing Walls Joined with Clay.

In the caves are found very crude structures of large stone, wood, bark and grass, and the well built houses of roughly dressed stone laid in clay mortar, or of adobe strengthened with small stone, grass or twigs. In the valleys and on the mesas the ruins of stone houses are about the only objects that remain to suggest the story of their occupation.

The stone houses of the caves and sheltering cliffs do not differ materially from those found out in the open. The walls, sometimes single, more often double, are made substantial by fitting the stone carefully together and chinking all holes

with small stone. Care has not been taken to break joints, however, and, where this has occurred, it has been more by accident than by purpose. The art of building one wall into another was not understood; but when an addition was made to a house, the new wall was simply built against the old and fastened with clay. These walls varied in width from ten to twenty-four inches and often rose to two and three stories,



Snake House Near Oijato.

which means a height of from twelve to eighteen feet in the dwellings, while some towers stood very much higher. Probably the most primitive dwelling was a hovel of one room with its fire place; but it is a rare thing to find the ruin of a home either in the cliffs or out in the open of less than two rooms. Most of them are plainly community houses, containing many rooms and affording shelter to many families.

Traces of a very early occupation are found here and there in large caves, lying beneath the walls of later dwellings. An excellent illustration of this earliest culture are groups of ruins that were uncovered by the Utah Expedition in the summer of 1909 in the Sagi ot Sosi canyon, near the Utah-Arizona line. Lying high up in the cliff that forms the western bound-

ary of the canyon are two large caves. In the back of one of these are still standing some of the walls of a small group of rooms of the type of the best period of occupation, while below is a mass of debris beneath which lie the floors and parts of the walls and the roofs of a series of rooms of an earlier habitation. In the other cave are similar series which furnish abundant evidence of a contemporaneous occupation.

The caves are long and shallow with high projecting roofs that did not furnish entire protection from the storm. Therefore the houses, one story in height, formed long rows of irregular rooms that conformed to the curve of the caves, and were carefully roofed. The floors were the solid rock of the bottom of the cave leveled with clay, or a thick coating of clay spread over a foundation of earth and willow twigs that had served to level the more sloping portions of the cave floor. The walls were made by setting up large flat and irregular pieces of sandstone, two to four feet long, braced and steadied on the lower side by posts of pine and cedar set into the earth and clay of the floor. The timbers supporting the roof rested on the tops of these posts and the top of the rear wall, or in convenient hollows formed in the back of the cave. Across these were laid small poles, a few inches apart,



Head Bands and Sandals.

over which was spread a thick layer of rushes or several layers of cedar bark, all carefully placed and probably originally covered with a coating of earth. The holes in the side walls had been chinked with wads of cedar bark and long grass. While some of these rooms had been carried away by the sliding of the supporting stone and refuse, parts of others stood protected by the thick mat of their roofs that had settled down over them, and were held in place by the mass of rock and sand that had accumulated above. On the floors of some of these rooms were found stone metatas (mills) and manos (grinding stones), stone axes, wooden planting sticks and implements for preparing yucca fibre, wooden and horn scrapers, bone awls, many pieces of rope, cord and yarn made of yucca fibre, pieces of cloth, a head band in colored design and thirty-three complete and six parts of sandals, together with pieces of baskets and rush mats, a few flints, and a few clay ornaments. The sandals are well woven of yucca cord and yarn, some, in raised patterns, are exceedingly pretty; and the basketry and matting give evidence of skill as well as industry. Two bundles of yarn were evidently the warp or woof that had been set up in small looms ready for weaving; but only a few threads of the filling had been run in across one end of what was to form a piece of yucca fibre cloth. The yarn is quite evenly spun, and the laborious process of weaving in a simple hand loom is easily discernable. Aside from a very few pieces of broken bowls, no pottery was found in these older ruins. These vessels had been very crudely moulded out of a coarse clay strengthened with mica, and are similar to the sherds of the oldest specimens of pottery found on the plains of Troy and the hills of Etruria. These were the first attempts of men to manufacture cooking utensils from the clay which they had found so useful in forming the floors and hearths of their homes.

In another cave in a side canyon of Sagi ot Sosi, about three miles above the ruins just described, were found the remains of another old village lying beneath the walls of a later well built hamlet. Only parts of a few of the older rooms remain, as they seem to have been largely destroyed in the construction of the later habitations. About a third of what



Cave Containing Ruins of a Hamlet Built Upon the Ruins of an Older Habitation.

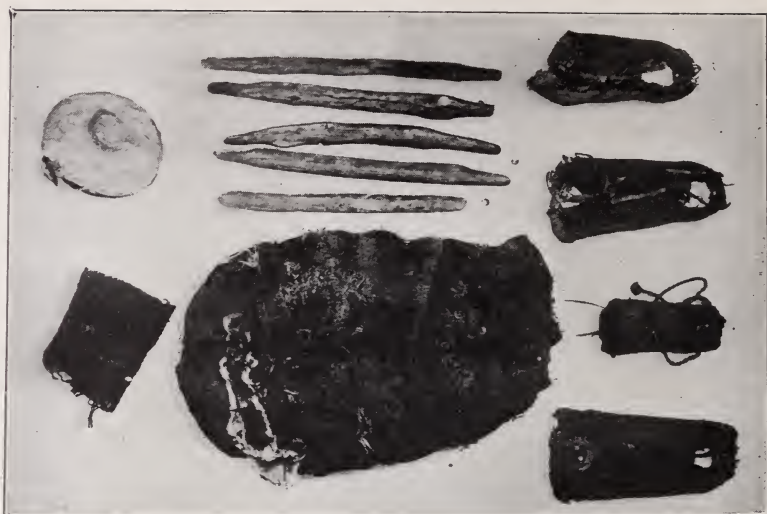
may have been an old kiva (ceremonial chamber) had been left, as a new kiva had been built over the remaining space and extending a little farther toward the front of the cave. The piece of the old room left at the back had been filled up with all sorts of rubbish, the walls of other rooms nearly all removed, and the hollows leveled up to form the ground space for a group of new rooms that had been constructed along the back of the cave. The floors of these rooms were nearly on a level with the roof of the new kiva in front. In the section of the old circular room that remained, about two inches above the floor and standing beside an upright post, were an old dark corrugated olla (storage jar) and a smaller smooth olla of red ware, decorated with geometrical designs in black. The corrugated olla had been cracked and was held together by an inclosing net made by tying strips of yucca leaves together, and the red olla contained about two quarts of excellently preserved red Indian corn. About three feet away another large olla of coarse dark ware was found by the side wall standing directly upon the old floor. The tops of all of these had been covered with small flat stones, and the accumulating



Smooth Olla with Corrugated Neck. Corrugated Olla with Net of Yucca. From Sagi ot Sosi.

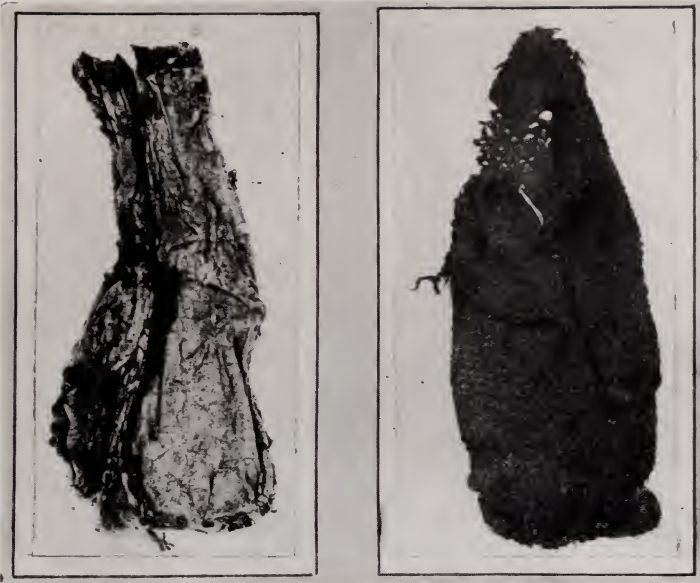
debris had buried them beneath the floor of the room that had been built above. They, however, seem not to have belonged to the earliest occupation, but rather to have been deposited there for storage purposes by later inhabitants of the cave, and covered up and forgotten before the last rebuilding of the cave took place.

In this and other side gulches of Sagi ot Sosi were found in large caves numerous pot holes or storage chambers dug out of the hardened sand or soft shale that formed the bottom of the cave. These holes were usually shaped like a large olla, and varied from one and one-half to three and one-half feet in height and from one-half to two and one-half feet in their largest diameter. They were covered usually with pieces of split cedar or strong sticks, over which was spread a layer of cedar bark and then all covered with several inches of sand. Some contained only the sand that had caved down and entirely filled them, while in others were found seeds, medicine bags and other treasures. In one small one, found in a cave on the west side of the canyon, were a medicine bag, woven with yucca yarn in colors; a little basket of excellent make, with rows of humming bird feathers woven into the meshes on the inside, while over the top had been stretched a piece



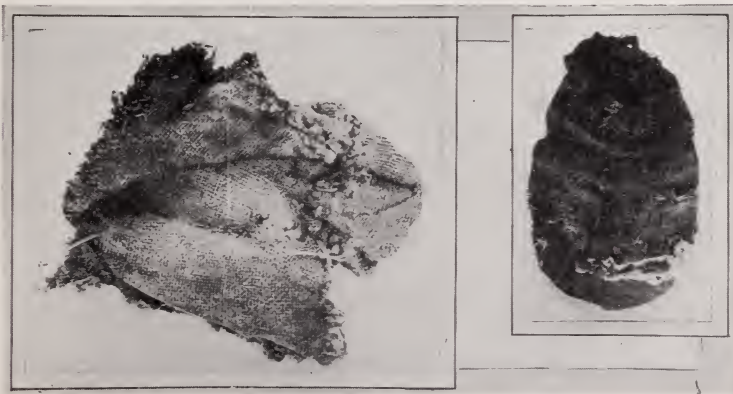
Medicine Man's Outfit.

of buckskin that was carefully held in place by a buckskin thong; four weaving sticks, and four sandals. The sandals are of yucca yarn, well woven and squared at the toes. They are of different sizes and perhaps represent four periods of life: childhood, youth, middle age and old age. In a high cave at the head of a gulch on the east side were found a number of these pot holes. One contained a quantity of stone (calcium carbonate) broken into small pieces, ready, apparently, for grinding into the powder from which they made a white paint, seen in numerous pictographs on the cliffs, and a buckskin bag in which were a red stone (manganese dioxide), a black stone (hematite), and a piece of deer's tail. In others lay bags of loosely woven yucca lined with grass or cedar bark, or bags of cedar bark fibre held together with interlacings of yucca cord. In another pot hole was nearly a half bushel of the seed of a coarse bunch grass, in another several quarts of a finer grass seed, and in still another a small quantity of corn, both shelled and on the cob, and a few handfuls of squash seed. It is easy to identify the grass seed with varieties of bunch and wheat grass still growing in the region.



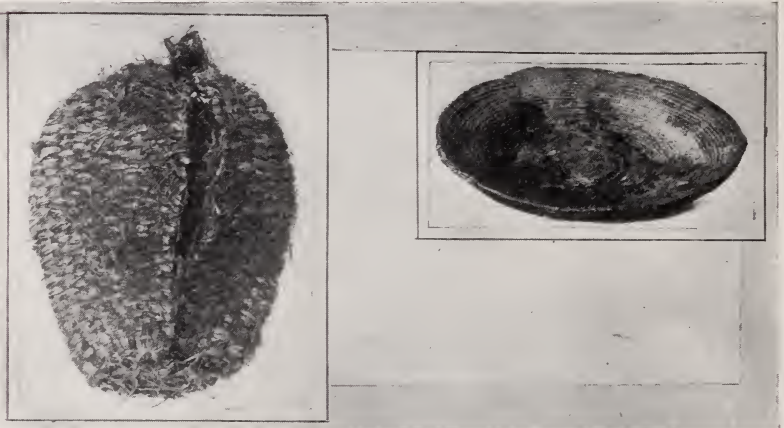
Deerskin Medicine Bag. Medicine Bag of Human Hair.
Sagi ot Sosi.

In the ruins of the stone cliff dwellings, corn, beans and other seeds are commonly found stored in earthen jars; and the fact that no remains of pottery whatsoever were found in any of these caches and that these fine seeds were stored in



Woolen Cloth. Three Color Yucca Bag with Patches of
Deer Skin. Sagi ot Sosi Canyon.

bags of such primitive construction, and that these caches were in close proximity to the ruins of a very simple culture, leads one to conclude that they belonged to the people who built rude huts and occupied the caves before man learned to build the more substantial stone houses. In the deeper part of this cave evidences of old crude walls and several beds of charcoal and ashes show where fires have been built for a long time. A round mortar has been carefully pecked out



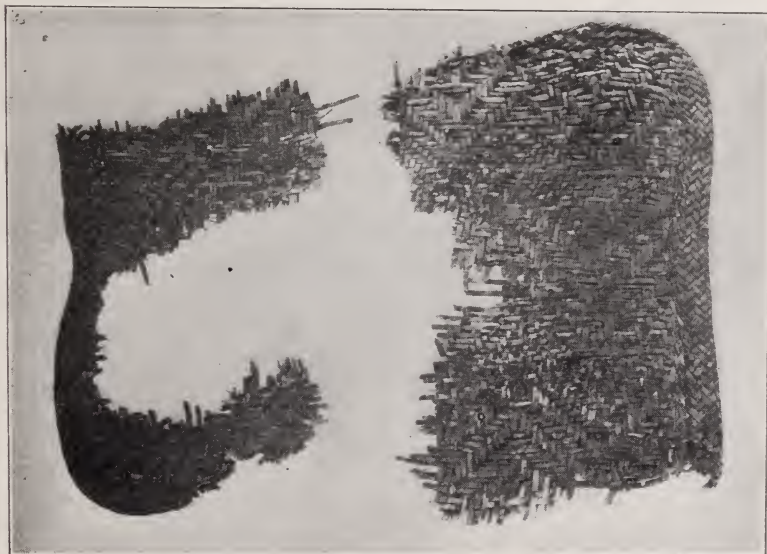
Cadar Bark Basket. Food Basket. Sagi ot Sosi Canyon.

of a rock in front, and in another at one side is a smaller mortar near which, on the flat surface of the stone, have been painted four impressions of a child's foot, two of the right and two of the left. In a large flat rock lying on the slope below the pot holes, representations of two large serpents have been carefully pecked out of the sandstone. Both are rattlesnakes, and the larger seems to be losing his rattles, as two are represented as detached from the tail.

In another cave near by were the remains of a very old kiva, some house walls and some caches. The walls of the kiva and the rooms had been made mostly of clay strengthened with stone and wooden timbers; while the caches were either round or rectangular and made of flat stone set on edge, or of reeds set vertically and plastered with clay. There are two round and one rectangular, made of flat stone and clay,

and one rectangular made of reeds and clay. The largest of the circular caches is five feet in diameter, and the one of wattle work measures seven by four and one-half feet. The limits of this report will not permit a careful description of the kiva, the construction of which is exceedingly interesting when compared with other kivas of this section and the kivas of other parts of this region.

The most important articles found in this kiva were ornaments and prayer tokens of feathers and fur, stripped feathers, paint brushes, wooden needles, a sandal woven in an elaborate pattern in colors and two small sherds of decorated pottery.



Rush Mat from Burial, Sagi ot Sosi.

Lying beneath a large rock near the center of the cave were the remains of an adult buried beneath quantities of rock and a few pieces of timber. The body, wrapped in a feather robe, lay on the left side with the head toward the northeast and the feet drawn up under the hips. Beneath it on a bed of sand had been placed a large rush mat, similar in weave to the pieces found in the other caves of this neighborhood. On top of the body lay three wooden planting and weeding sticks of



Canteen and Bowl from Cave Burial in Sagi ot Sosi.

different forms and a horn spade fastened to a wooden handle; while beside it were a drab-colored canteen ornamented with a rather crude design in black, and a well made red bowl decorated in black. This burial may have occurred long after the group of rooms already referred to had been abandoned; but it is probable that this individual was one of the community occupying these ruins and that here we have a group that shows a transitional stage from the earlier, cruder culture we have described to the slightly larger plane of life maintained during the best pottery making period of these people.

Along a stony ridge in the southeastern part of Moab, Mr. Frank Hall, while excavating to lay the foundation of a building, uncovered some old adobe walls and floors that seem to belong to this early period. Only a few adobe of the lowest tiers had withstood disintegration; but enough were found in position to show the construction of the wall. At least four successive strata of charcoal and ashes, with interlayers of other debris, could be traced in the mound, to the last or highest of which these walls seemed to belong. In the same level was also found part of a floor that had been formed by leveling the earth in the required space, making a shallow excavation at one side and spreading over all a coating of clay, the oval depression forming a fire place two feet wide and three feet long and two and one-half inches deep. In

forming the walls of the rooms the builders had evidently taken great wads of wet clay, as much as they could handle, and laid them along end to end, patting the upper surfaces into an oval shape much resembling the back of a turtle. On this, when sufficiently dry, they had laid another row, carefully breaking joints, and so slowly had built up a substantial and enduring wall. In the debris on the floors were found



Two Adobes from Old Ruin at Moab.

a few pieces of broken pottery of the crude mica type similar to that found in the earliest cave ruins in Sagi ot Sosi. These buildings have been so exposed that only an occasional stone implement, flint or bit of pottery is now found to tell the story of their industries; but these indicate an early neolithic culture and seem to show that these early peoples built their homes out in the open as well as in the caves of the cliffs.

That which most attracts the attention of the visitor in

this interesting region are the ruins of the well built structures of stone and clay. From the uses which they served, they may be divided into four classes: the living rooms, the store rooms and granaries, the kivas, and the towers.

In caves, the dwelling rooms and store rooms occupy the main portion of the cavity, filling in the entire back if the roof is high, otherwise stretching across the cave from side to side and occupying every foot of available ground. When the floor of the cave is sloping, rising toward the back, the rooms have been built in rows that extend across the cave and rise one above the other in ascending terraces. Good illustrations of this style are the "Swallows" Nest" and "Betatakin" in Sagi canyon. In the side gulches, running from Comb Ridge into Butler's Wash, are a number of large caves which have fine springs at the back. Here the dwellings have been built across the front of the cave where the ground was dry and out along the side underneath the projecting cliff. In Allen canyon, where low, deep caves extend well back into the cliff, the house was built along the front and the space behind utilized as a burying ground. The kivas have invariably been placed in front, where the slope gave opportunity to locate them wholly or in part below the level of the other rooms.

When the houses were built beneath a sheltering rim-rock, they extended along in a continuous row or in groups often for hundreds of feet, as seen in the ruins in Tody gulch, a branch of Grand gulch, and in White canyon between the Augusta and the Carolyn bridges.

The rectangular rooms vary from about four by six to nine by thirteen feet. A few instances of larger rooms are found, but they are the exceptions. The floor consists of a layer of clay that has been spread over the leveled space and trodden to a hard surface. In some of the rooms the side walls have been plastered with clay to a height of about two feet; but usually the builders have been satisfied to fill the chinks between the stones with clay without attempting to cover the entire wall or form any smooth surface. The prints of fingers and knuckles and sometimes the whole hand have been left in the clay as it was pressed into position.



Betatakin (Side Hill House) Showing Terraced Structure. Sagi Canyon.

The floors of the second story and the roof have been constructed in the same manner, so that it was an easy matter, evidently, to add a second or even a third story when necessary. The supporting beams of cedar or pinon were laid into the wall from side to side about three feet apart. These vary from three to six inches in diameter, as the size of the room and the weight to be supported differed. Across these were laid poles a few inches apart, across which in turn were placed willow or greasewood sticks, laid evenly and packed close together. Sometimes pieces of split cedar took the place of the sticks. On this was laid a thick mat of cedar bark or coarse marsh grass, often two courses, the upper one being placed at right angles to the lower. Then over all was spread a coating of moist clay about three inches thick and the surface leveled and packed to an even hardness. The outer walls rose to the top or a little above the roof, so that the materials are protected and the roof made perfectly tight.

The rooms in which fire pots are found have openings in the roof for the escape of the smoke; but most of the cooking was evidently done outside. There are open places before the houses or on the terraces between groups of rooms where are found fire places, grinding pits and other indications of kitchen accessories. The badly blackened condition of the walls of some of the rooms is probably due to the fires built in them for warmth during the cold storms of winter and for the celebration of rites connected with the family. The entrances are small rectangular openings, usually about eighteen by thirty inches, penetrating the end or a side wall about a foot above the floor. The lintel was one or more flat stones supported by two or three sticks of wood, which they seemed to deem necessary to sustain the weight of the wall above. The sill was also a slab of sandstone, which has often been worn to a polish by the many hands and knees that have crept in and out through this small doorway. Rooms situated on almost inaccessible ledges of the cliffs, and sometimes those of the first story were entered only through openings in the roofs. These were usually used as store rooms, though not invariably so; for some give evidence of use as regular habitations.

The rooms used for storage purposes are easily distinguished from living rooms, from the fact that they seldom have floors other than those which the natural cliff or earth provide, their walls are unblackened by smoke, and their entrances are provided with grooved casings into which a flat stone has been carefully fitted. Hollows and corners in the cliffs have often been turned into granaries by building a



Granary from White Canyon. General View and Door Details.

wall across the front and inserting a door of the type just mentioned. These walls are usually built of stone laid in clay or entirely of clay. Sometimes, however, sticks of willow or greasewood, placed on end close together, and held in position by horizontal strips bound on both sides of the up-rights and then covered within and without by a heavy coat of clay plaster, have formed the wall. Such storehouses were easily accessible, and with a carefully fitted and barred door-

way afforded excellent protection from rats and squirrels. Good specimens of such granaries were found in White canyon near the Augusta bridge.

A few of the walls of rooms in "Kitsil" and "Betatakin" ruins in the Sagi canyons, and in "Inscription" house and



Ancient Plastered Wall, Kitsil, Sagi Canyon.

"Long" house in Nitsi canyons, have been constructed in a similar manner, and are excellent specimens of primitive lath and plaster. They bear a resemblance to the early Italian wattle work, traces of which have been uncovered in the ancient Italic habitations.

The kiva, however, was the most important room in these structures. Around it seemed to center the life of the family, and from it undoubtedly radiated those influences that held the clan together and helped develop the community houses. The kiva was the church and the council chamber, the sacred place in which the church and state were as effectively united as they ever were in the ancient temples of Greece and Rome. Through it proceeded all the germs of life that rose to an existence beneath the broad sunlight of the open sky. Here the people came close to mother earth and invoked the life-

giving powers which she seemed ever capable of sending. Here, by thought and council, they prepared themselves for the responsibilities that awaited them in active life under the full light of the sun father. Thus to serve these purposes it was natural that the kiva should be built as nearly round as possible and sunk below the level of the other structures. In the caves this was brought about by placing the kiva at the front of the cave on the descending slope. Sometimes a level floor has been secured by pecking away the sandstone on the upper side until the required space was obtained, or by using stone and clay freely in leveling up the lower side of the sloping cliff before the cave. These circular rooms are usually from twelve to fifteen feet in diameter, although a few examples have been found of still larger dimensions. The side



A Kiva Showing Firepot and Sipapu. Alkali Ridge.

walls, from one to two feet thick, are of stone laid in clay mortar, and are more carefully built than most of the walls of the rooms already described. They rise to a height of from five and one-half to seven feet and are covered with roofs usually similar to those of the other buildings, but the style of the roof and the form of the side walls differ somewhat in the different localities, showing the influence of local conditions and of tribal customs and tastes. The inside of the wall

is usually covered with a fine clay plaster up to a height of about three feet and often over the entire surface. In some of the ruins one can easily trace three different coats of clay, two of which have been added at later periods as the wall became old and blackened. A thin surface coating of gypsum has been added in a few instances, that gave a smooth, white face to the interior. At about three feet from the floor the wall is set back from one to two inches. From that point to the top the wall usually takes the form of six buttresses, with the same number of recesses between them. The recesses are from six to twenty-four inches deep and almost invariably walled up at the back. A few instances have been found where the back of a recess seemed to have been formed by plastering a rather loose filling of stone with clay. The buttresses carried the large beams that supported the roof; and the recesses have been explained as representing the four cardinal points of the globe and the zenith and nadir. The six recesses are characteristic of the circular kivas so far examined north of the San Juan river, and in some of those found south of that stream; but the older ones examined in the Sagi and Sagi ot Sosi canyons omit the recesses entirely, and one well built kiva of the best type had a single recess extending around half the room. May not the recesses have been rather features of construction and utilized as convenient resting places for the paraphernalia used in the sacred rites connected with the place?

The most constant and striking features of the kiva are the sipapu, the fire pot, the fire screen, and the sacred passage leading from behind the fire screen through the wall and connecting with a shaft that rises outside the wall to the air above. Space will not permit a discussion of the variations in construction and the probable purpose of these important features. The sipapu, however, signifies the sacred place through which man proceeded from the earth,* and the passage and shaft, probably, are the sacred way by which he passed to the higher plane of the earth's surface into the full light of the sun.

*Eighth Annual Report of Bureau of Ethnology, p. 121, 131.

In one of the branches of Nitsi canyon south of Navajo mountain, where good workable stone were not so abundant, were found well built houses of adobe. Here the foundations and sometimes the entire first story were of stone laid in an abundance of clay mortar, while the superstructures were of adobe. In some of these walls the clay had been mixed with grass and moulded into large rectangular adobe brick before being built into the wall, while in others the wall had been built up in horizontal sections by supporting the sides with flat stone and then filling in the trough so made with clay



Adobe House, Nitsi Canyon. Walls formed by Sections of Clay Strengthened with Grass and Twigs.

in which grass or willow twigs were laid for strengthening material. Entire rooms of this construction stand as solidly today, seemingly, as when they were first built. From the construction of the rooms and from the materials of wood and yucca fibre and from the excellent pottery sherds found strewn about them, it is evident that their inhabitants belonged to the best period of development of these early people. The more extensive use of adobe in the construction of these houses was due largely to the greater scarcity of good flat stone in this vicinity, and shows the readiness with which the

people adapted the most available material at hand to their immediate needs. The "bricks with straw" and the mud concrete walls strengthened with long grass and sticks imbedded in the clay are a feature not found elsewhere in the structures of this region.

Scattered along the beds of the canyons, through the small valleys, over the mesas, and perched on the points of cliffs that extend out into these valleys and canyons, or clustering around the heads of small side canyons, are found almost numberless ruins of ancient pueblos or villages. Some contained only one and two rooms and were the homes, seemingly,



Ruin by Marsh Pass, Arizona.

of single families; while others contained hundreds of rooms and covered several acres of ground in their rambling construction.

Frequently a large building that has served as a fort or place of assembly, and perhaps both, was surrounded by many smaller structures grouped about it, as in the case of a large ruin near Marsh Pass in northern Arizona. The main building

was a rectangular structure, ninety feet long and ten and one-half feet wide, that evidently was two stories in height. Parts of the walls above the first story still stand and some of the timbers that supported the floor of the second story are yet in place. All about are found the ruins of smaller structures, and the ground is full of broken pieces of pottery of excellent manufacture in corrugated ware, and in the smooth white ware decorated in black and the red ware decorated in black and yellow.



Tower Ruins in Ruin Canyon, Utah.

Along the McElmo and its side canyons and some of the branches of Montezuma canyon in the southeastern part of San Juan county, Utah, are found the remains of rectangular and round towers that seem peculiar to that region. They are usually grouped about the head of a side canyon in which are found one or more good springs. The walls of some still stand, ten and twenty feet in height. About one hundred miles northwest from this locality, near the Colorado river, in what is known to the cattlemen as the Beef Basin country, is a series of similar ruins. They consist of ten groups of buildings, eight of which are situated on projecting points of a cedar ridge that runs along the southeast side and two

on the first rise of ground on the northwest side of a depression called Ruin Park. In these pueblos are found rectangular and round towers, the walls of which are now ten to sixteen feet high.

Along the side walls of Montezuma canyon and its tributaries are numerous natural caves, nearly all of which have been occupied in former times; but more striking still are the remains of groups of buildings found wherever the canyon widens sufficiently to afford fields of arable land along the bottom. One such little valley is a mile and a half long and three-quarters of a mile wide in its broadest extent. Within this irregular stretch of bottom land are found the ruins of sixty-nine buildings, varying in size from four to two hundred rooms. With nearly every one of these can be traced the outlines of one or more kivas of the circular type sunken below the level upon which the main buildings stood. Connected with the largest building were at least ten other rooms, and perhaps more, as one section of this structure has been carried away by the washing of the creek and the consequent caving in of the bank above which it stood. Below this valley, scattered over the points and slopes of cliffs that stand out into the canyon, are two other quite extensive groups of ruins. In connection with these are the walls that have been formed by standing long slabs of stone on end, side by side, referred to by Mindeleff in the Eighth Annual Report of the Bureau of Ethnology.

Near the heads of many small canyons, particularly along Alkali Ridge and Mustang mesa, are found numerous villages, extensive for a primitive population. They seem to have been begun as a group of rooms built around three sides of a court, in the center of which the kiva was located. Sometimes this court was extended and one or more kivas added, with a consequent extension of the groups of rooms, and again other rows of rooms were built along the back or side of the first group, an entirely separate court laid out, and a kiva built therein. Thus the pueblo grew, section by section, and generation after generation, as the clans enlarged when the family had numerous daughters to marry. Among the Hopi and other tribes of this region the descent is through the

mother, who owns the home, the children and so forth, and a similar clan development through a female ancestor probably existed among these ancient peoples. The arrangement of the buildings and the presence of numerous kivas show a clan organization, and the sinking of the kiva wholly or in part beneath the surface and the presence of the sipapu in the kiva floor indicate a worship of the earth mother and a tracing of descent through the maternal line. Many of these villages grew until they covered large areas of ground with structures that sometimes seem to have a plan and a pretense at regularity, but more often grew as the fancy of the builder and the availability of the ground dictated. One such pueblo on Alkali Ridge, about twenty-five miles south of Monticello, was built in the general form of a capital letter E. It was 620 feet long and 380 feet wide in its widest part, and contained forty-one kivas. Another, about ten miles west, near the head of Rustler's canyon, covered an area of more than four acres.

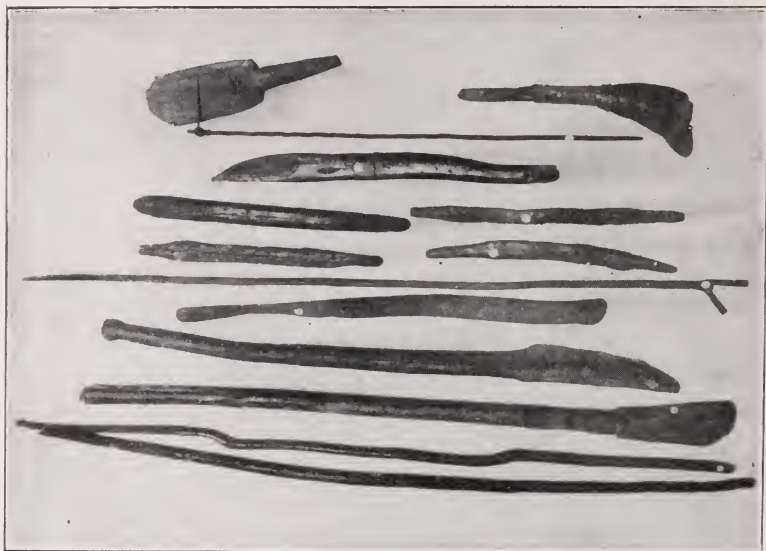
The ruins of all these structures are now mere heaps of stone, in which big cedars and aged sage brush are often found growing. The surface stones are battered and worn into rounded boulders by the beating of the storms and winds; but when these are removed and the portions of the walls still standing exposed, the stone forming these are found usually quite well dressed. These ruins are undoubtedly very old; and it is not a difficult matter in the larger ones to locate the oldest section and trace the growth of the village.

The industry and skill of these people is shown not only in the extent and variety of their building operations, but also in their handicrafts. They were a neolithic people, and no evidence has yet been brought to light that they had any acquaintance whatsoever with the metals. The earlier culture of which we have spoken corresponds quite closely with that of the neolithic people in Italy, and the "hut dwellings" of that region bear a strong resemblance in form to the earlier kivas of the "Cliff Dwellers."*

Numerous large mauls and hammers for breaking stone, and fine axes and hatchets for wood cutting, have been found in all their ruins. The axes and hatchets have been carefully

*The Stone and Bronze Ages in Italy, by Peet, p. 55.

smoothed and sharpened on the sandstone, and grooves evenly ground out for holding the thongs by which the handles were bound to the blades. Excellent specimens of flint arrow points, spearheads and knives are found everywhere, and the great variety of mealing stones, polishing stones and charm stones furnish a field for study in themselves. Several kinds of wooden planting and weeding sticks and of horn spades fas-



Implements.

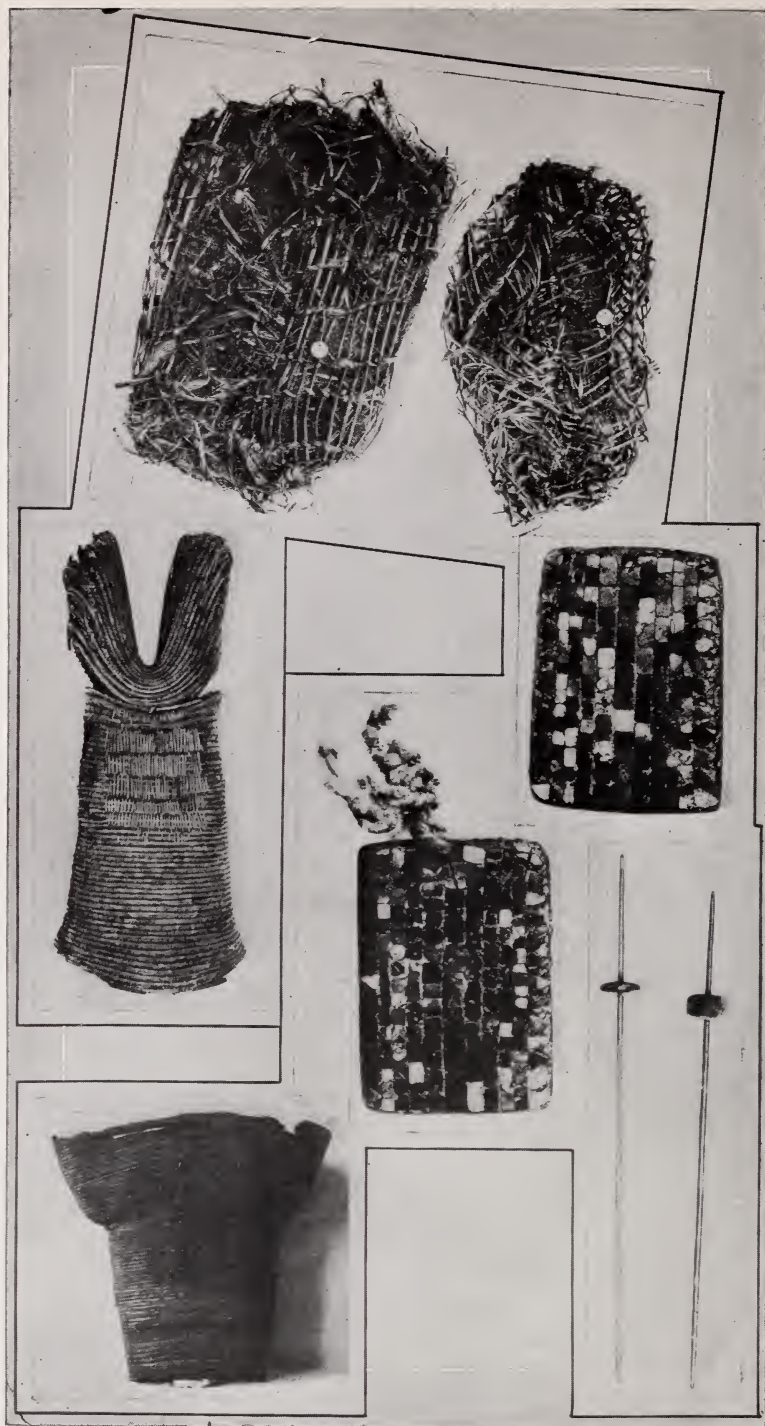
tened to wooden handles, together with the many specimens of corn, beans, squashes and gourds found in the ruins give ample evidence that they were an agricultural people and depended largely upon the products of their fields for sustenance. Many of the sections formerly under cultivation and frequently the location of reservoirs and the courses of ancient irrigating ditches can readily be traced.

Seemingly, their only domestic animal was the turkey. Turkey feathers, turkey bones and even turkey eggs are in evidence. These animals increased the food supply of their owners and helped furnish the materials from which elaborate feather robes were made.

The yucca plant played a very important part in the life of these people. There are two varieties still growing in the country: the broad-leaved and the narrow-leaved yucca. The leaves of both kinds provide an excellent fibre used by the ancients in the manufacture of rope, cord and yarn, and in certain varieties of baskets; while the roots make a fine soap which was, perhaps, occasionally used by these people. From the cord and yarn they wove cloth sandals, belts and carrying bands for the head. Some of the sandals and the belts were in beautiful raised patterns and in colors. Numerous pieces of cloth woven from cotton yarn were found in some of the ruins, giving evidence that they obtained the fibre from the native cotton plants.

Since they had no "beasts of burden," and so were compelled to transport the products of their fields on their own backs, it was perfectly natural that they early developed the art of basket weaving. Specimens are found from the large carrying basket that will hold a bushel and more to the tiny cone-shaped receptacle used for gathering pitch from the pinons. They are well made, usually from the split squaw bush that still grows in the canyons and is used by the Ute and Pahute women in making baskets of a similar weave. Some of the smaller baskets found among these ruins were woven in several different shapes from split yucca leaves, and were used for storing more precious seeds, nuts and sacred ceremonial articles. The accompanying pictures of these baskets will help to give some idea of their variety and workmanship.

Many spindle sticks with their spindle whorls have been gathered out of the debris covering the floors of the rooms. The spindles average eighteen inches in length and are made of hard wood, carefully rounded and drawn to quite a sharp point at one end and left rather blunt at the other. The spindle whorls are usually rounded wooden buttons with a hole bored in the center, through which the spindle is pushed until the point is the proper distance to hold the thread conveniently as the spindle is rolled and the fibre twisted into yarn. A very few fine whorls of horn have been brought to light, some of which are two and one-half inches in diameter and only one-sixteenth of an inch thick. Many show the



Group of Baskets. Basket from Mrs. Witherill. Ear Pendants. Large Carrying Basket. Spindles.

effects of long wear and handling, and are eloquent advocates of the patient industry of these Indian mothers.

Good mats were plaited of coarse rush grass, one specimen of which, for instance, measures three by two and one-half feet. These usually had a border made by plaiting an extra strip two inches wide onto the upper surface of the mat close to the edge. This strengthened the mat and protected the edge from rapid wearing and breaking. Small mats of braided cornhusks were used as rests for jars with rounded bottoms. Screens were also used over the entrances, made by fastening the long straight stalks of the coarse marsh grass together with interlacings of yucca cord, much as many of the screens of today are woven.

The peculiar feather and fur robes often found wrapped around bodies buried in the cliffs were woven like the screens, only ropes of feathers or fur took the place of the long rush stalks and a border was made by doubling back and interlacing the ends of the feather cord. These ropes consisted of a heavy cord of yucca fibre wound tightly with strips of feathers obtained by removing the quill and splitting the feather down the center, or with narrow strips of fur. Thus, when completed, they form fluffy strands about as large around as the little finger; and when woven closely together through a loose warp of yucca cord, formed a warm wrap that, no doubt, was deemed an essential part of the royal and ecclesiastical dress of that time.

Like all primitive peoples, they were superstitious and fond of ornamentation. They used everything within their reach and knowledge that had an air of mystery about it, as a charm against the evil spirits; everything bright and striking in appearance to increase the attractiveness of their scanty wardrobe. Bits of hematite, some of which were crudely shaped to represent birds, seem to have been highly prized as charm stones; while beads of shells and beads and pendants of turquoise and other brightly colored stones testify to the existence of human vanity in that age of "the simple life." One pair of ear pendants found in "Betatakin" in Sagi can yon deserves special mention. Each pendant is a flat piece of thin wood, one inch long and three-fourths of an inch wide,

one side of which is covered with tiny squares of turquoise set in hardened pitch. The turquoise have been very carefully cut and the setting neatly done. There is a similar pair in the American collection from Arizona in the Berlin Museum, but of far inferior workmanship.

The greatest skill and artistic ability of these people, however, is shown in their pottery. Clay is abundant and easily lends itself to manipulation and expression, so that it has always been one of the first materials employed by a people in the development of the domestic arts and in satisfying their desire to create forms as graceful as those seen in the natural world about them. We have already spoken of the first forms of their pottery—the crude ware of coarse clay found in the caves in the debris of the oldest huts. Only a few specimens of this are brought to light, because many of them have probably disintegrated. Numerous examples of a plain ware, made of rather coarse clay and varying in color from a light drab to a black, are found all over this region. The forms are chiefly bowls, pitchers and storage jars for water. The surfaces have been left quite uneven, are seldom decorated, and the clay is imperfectly fired. Some specimens of water jars found in Sagi ot Sosi canyon have the necks of the jars left in the broad flat coils with which the jar was originally built, while over the body of the jar the surface has been made as smooth as possible by pressing these coils together with the hands as the vessel was built up. (See page 13.)

Practically all of the pottery made by these people was constructed in a similar manner. The clay was carefully selected and kneaded and then moulded into small ropes. The potter, using a plate as a foundation, started in the center and coiled these ropes of clay one about the other, pressing them together, smoothing the inner surface, and building the piece to the form desired. In the earlier ware the surface has been made as smooth as possible within and without by the hands and then left in that condition; while in the corrugated ware the edges of the flattened coils form the outer surface. These ridges have been made even and regular, and are usually indented by the thumb nail or some sharp instrument. In some

instances these indentations have been carried out more elaborately, and varied to form a decorative pattern. The color is usually the dark drab resulting from the moderate firing of the ordinary clay of the region; but a few pieces were found made from red clay. The corrugated ware was used for storage and water jars, for cooking vessels, and for pitchers. The accompanying group shows a number of typical forms taken from Utah on the northern side of the San Juan drainage.



Corrugated Ollas and Pitchers. The Top Central Olla Shows Indentations in a Pattern.

The highest development of the art among these people, however, is seen in the smooth black and white, red and black, and the red and yellow ware decorated in white, black, brown and green. Occasionally a piece of this more elaborately decorated ware has the exterior surface left corrugated; but usually both surfaces have been smoothed and polished until they are hard and even. This has been done with sandstone

and finished off with pebbles of flint and quartzite used as polishers. After the piece was thus constructed and dried, it



Ollas in Black and White. Alkali Ridge.



Olla.

Olla Design.

Jar with Lid.

was covered with a white wash or mineral paint and allowed to dry again. Then on this white surface the design was painted in black. The black seems to be a vegetable paint.



Bowls in Black and White. Alkali Ridge.



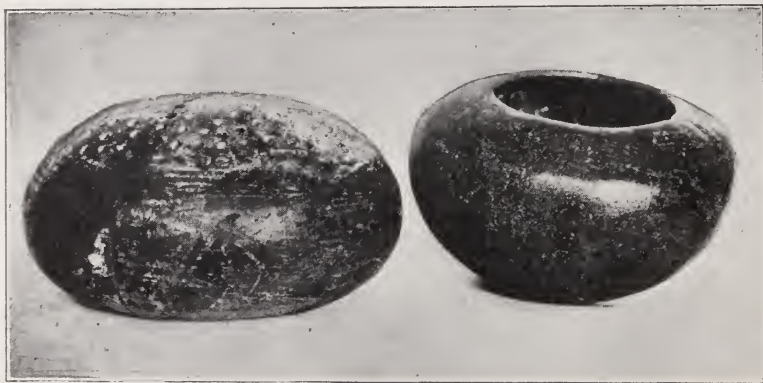
Pitchers and Mugs. San Juan County, Utah.

and retains its color in a marked degree. The pieces so prepared were then fired, probably in temporary kilns built of the best material at hand that would produce an even, intense

heat. One instance, only, of what seemed to be a well defined stone pottery kiln has been brought to light. That is in front of a cave ruin located on the west side of Butler's Wash, about ten miles from Bluff.

The red and black ware has been fashioned in a similar manner, only the clay contained iron oxide and the wash with which the piece was first covered was red instead of white. This red clay is usually of a very fine quality, so that the walls of the vessels are often thinner and more carefully moulded. Some of them are superb in shape and almost as even in their curvature as wheel-made pottery. A much greater proportion of the ware in use along the Sagi canyons was more red than that found north of the San Juan river. But excellent qualities of both the black and white and the red and black are found on both sides of the stream, and show a contemporaneous development. The red ware of the Sagi canyons, however, often adds white and yellow to the black in the decorative designs of bowls and jars, and some red bowls were found in "Betatakin" which were decorated with excellent designs in four colors: black, white, brownish yellow and green.

The forms of the painted pottery are of much greater variety than found in the coarse and corrugated ware, and served widely different uses. Besides the large ollas for storing water and seeds, one finds bowls of every size and



Strainers. Sagi Canyon.

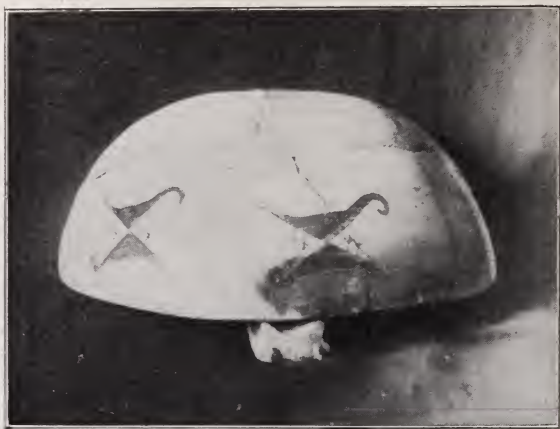
description, small jars, ladles, mugs, pitchers, jugs and canteens in a profusion of shapes and styles of decoration. Some interesting little jars that evidently served as sieves were brought to light in the Sagi country. They are about seven inches in diameter and three inches high, and have flattened tops with a round opening in the center. The bottoms are



Bowls with Sunflower Design. Duck Bowls. Prairie Dog Jug.

curved and neatly perforated with round holes from one-eighth to one-sixteenth of an inch in diameter. One fine specimen in red ware was given to the Museum by Mr. C. A. Colville of Oljato, another was found in the Ladder House ruin and two in black and white in "Betatakin" ruins in Sagi canyon. One jug, obtained from Montezuma canyon, was moulded to represent a prairie dog sitting on its haunches; a small dish, donated by Mr. Rogerson of Monticello, represents a duck, and a jar found in Sagi canyon is fashioned after a moccasin; but the animal forms are unusual and the decorative

designs commonly follow geometrical patterns. Two interesting exceptions are a bowl from McElmo canyon, donated by Mr. A. V. Kidder, decorated on the outside with representations of turkeys, and a bowl from Mustang mesa, decorated on the inside on the bottom with the figure of a man dancing on a sunflower. The decorations of ollas, seed jars, mugs, pitchers and so forth are on the outside, of course; while



Bowls with Turkey Design. McElmo Canyon.

bowls are usually decorated on the inside. A few specimens of bowls, however, have been found decorated both



Plain Red Olla Filled with Beans
in the Pod. Ladder House, Sagi
Canyon.

within and without and the red bowels of Sagi canyon regularly have one or more bands of brown extending around the top on the outside. Broken pieces of this pottery are found in abundance wherever the ruins of a pueblo are discovered, either in the cliffs or on the mesas. Occasionally whole specimens are found beneath the debris, protected by some recess or the lucky position of roof timbers as the roof fell in or the walls collapsed. Most of the complete pieces are obtained

from the graves, where they have been deposited with the



Red Ware.

dead to hold their food and serve their needs in the happy realm to which they were proceeding.

On the mesas and in the canyons north of Bluff it seemed customary to bury the dead near the pueblo, forming one or more burial mounds, or small cemeteries; but in the country to the south so far examined no such burial grounds have been discovered. It seems to have been customary, rather, to bury the dead one in a place here and there, as a favorable sand bank or mound of earth gave opportunity. Three illustrations will suffice to show the general method of burial, one of a skeleton lying about two feet below the surface in a burial mound on Alkali Ridge, the others of individual graves. The one found on the Kaenti was nearly uncovered by the washing away of the soil above it, while the Fable Valley skeleton lay four feet below the surface on a bed of charcoal two inches deep. By the head and along either side of the latter large flat stones had been set up on edge, forming a sort of rough sepulchre. It will be seen that they all lie on the side with the feet drawn up against the hips. Often the knees are also drawn against the chest, as shown in the burial on the Kaenti; and thus they have been placed back in the bosom of mother earth as nearly as possible in the same position in which they came from her embrace.

The walls found standing in the pueblos of the mesas show the same method of construction as those of the caves; and the kivas and the living rooms are adapted to the same religious and social customs. There is no appreciable difference in the stone and bone implements and in the terra cotta cooking utensils found in the ruins of the two situations. Sherds of the same kind of pottery, with similar decorative



Burials: Alkali Ridge; on the Kaenti; Fable Valley.

patterns, are found in the refuse heaps of both. Variations in form and in decorative motives are found in different sections. land along the canyon bottoms. No doubt the well protected showing the development of local and tribal characteristics; but no well defined differences are traceable between the mesa and cliff remains. The inhabitants of the mesa pueblos cul-

tivated portions of the plains at the same time the people of the cliff villages were gaining a livelihood from the patches of cliff dwellings near never failing springs continued to be occupied long after the mesa and valley pueblos had been abandoned; for it is evident that the removal of this people from their Utah homes was no sudden or general migration.

In the days when the songs and the laughter, the prayerful chants and the wails of sorrow of these men and women were heard echoing through the canyons and wafted across the mesas, there must have been considerably more moisture falling from the heavens to gladden the hearts of men. The evidences of a more extensive growth of oak and pine, the presence of cisterns and reservoirs where now it would be impossible to obtain enough surface water to fill them, and the location of large villages where now it is impossible to develop in the springs formerly used for the water supply, enough water to satisfy the needs of a small camp, all tend to show that there has been a gradual lessening of the rainfall and a consequent drying up of many of the springs. Land formerly capable of producing a good crop under primitive methods of cultivation, ceased to respond to the efforts of the planting stick and horn spade; and man was forced to search for a new location. Long periods of drought, with consequent famine and disease, probably played their part also in weakening and diminishing these people; until the remnants became an easy prey to the piratical Ute and the warlike division of the Navajos. Thus, gradually absorbed and forced southward, one group after another lost its tribal identity, and lives today only in the vague traditions and myths of the Zuni, the Hopi and the Navajo.

Their industry, their persistence in surmounting almost impossible difficulties, and their attempts to satisfy their aesthetic sense and reach out into a larger life, awaken the sympathy and interest of every student of mankind. Surely no more noble theme can challenge man's best thought than the path man has traveled in his progress from mere animal living and thinking today; and certainly Americans should be existence and barbarism to the place upon which mankind is acquainted with the struggles through which the human race has passed here on our own continent.

The University of Utah

THE UNIVERSITY OF UTAH at present comprises a group of four schools: the School of Arts and Sciences, the School of Mines, and the Normal School.

Entrance to any of these schools requires at least four years of high school work; and graduation from any of them requires at least four years of college work.

The result of this organization, by which at least four years of high school work are required for entrance and at least four years of college work for graduation, is to put the University of Utah upon a footing with the best colleges of the country. Students of the University of Utah enter Cornell, Columbia, Pennsylvania, and Harvard without loss of credits, and students from other universities pursue courses in the University of Utah without fear as to the relative value of the Utah degree.

The University grounds cover an area of ninety-two acres. On the grounds are nine buildings. The Library is one of the largest and best equipped in the State. There are laboratories in Chemistry, Physics and Electricity, Mechanics, Hydraulics, Metallurgy, Biology, Nature Study, Anatomy, Bacteriology, and Pathology. History and Embryology and Physiology; there are also excellently equipped shops for work in wood and iron.

Nearly one hundred professors and instructors give instructions in the University. In the various departments each year nearly two thousand students are enrolled. The graduating class of 1911 numbers nearly fifty college students who will receive degrees and about one hundred and fifty normal students who will receive normal certificates. A mark of the extent of the University is also to be found in the increasing number and variety of the courses of instruction.

For copies of the Catalogue of the University or for additional information about the University, or about any of its departments, requests may be addressed to the University of Utah, Salt Lake City, Utah.

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